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Abstract

This invention relates to contact structures for use in integrated circuits and methods of fabricating contact structures. In one embodiment, a contact structure includes a conductive layer, one or more barrier layers formed above the conductive layer, and a barrier structure encircling the polysilicon layer and the one or more barrier layers. In an alternate embodiment, a contact structure is fabricated by forming a polysilicon layer on a substrate, forming a tungsten nitride layer above the polysilicon layer, and etching the polysilicon layer and the tungsten nitride layer to a level below the surface of a substrate structure. A silicon nitride layer is formed above the tungsten nitride layer, and a ruthenium silicide layer is formed above the silicon nitride layer. The ruthenium silicide layer is then polished.

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